

Claim Listing

1. (Amended) A thin film device comprising: a metal sulfide layer selected from the group consisting of manganese sulfide (MnS), magnesium sulfide (MgS), and calcium sulfide (CaS), which is formed on a single crystal silicon substrate by epitaxial growth; and a ~~compound~~ thin film comprising an ionic bonding compound, which is formed on the metal sulfide layer by epitaxial growth.

Claims 2-76 (Cancelled)

77. (New) The thin film device as claimed in claim 1, wherein said thin film comprises at least two ionic compounds.

78. (New) The thin film device as claimed in claim 1, wherein said thin film comprises at least one selected from the group consisting of a metal nitride thin film, a metal oxide thin film, and a metal sulfide thin film.

79. (New) The thin film device as claimed in claim 1, further comprising another layer comprising a platinum group metal formed between said metal sulfide layer and said thin film comprising said ionic compound.

80. (New) The thin film device as claimed in claim 79, wherein said thin film comprises at least one selected from the group consisting of a metal nitride thin film, a metal oxide thin film, and a metal sulfide thin film.

81. (New) The thin film device as claimed in claim 79, wherein a metal of said platinum group metal is selected from the group consisting of rhodium, iridium, palladium and platinum or an alloy thereof, and wherein said platinum metal layer is in the form of a single layer or a multi-layer.

82. (New) The thin film device as claimed in claim 81, wherein said ionic compound thin film is selected from the group consisting of a metal nitride thin film, a metal oxide thin film, and a metal sulfide thin film.

83. (New) The thin film device as claimed in claim 1, wherein said single crystal silicon is a single crystal silicon (100), and said ionic compound thin film is an aluminum nitride (AlN)

having a (1120) surface as its top surface.

84. (New) The thin film device as claimed in claim 83, further comprising an ionic compound

having a (1120) thin film, which has a (1120) surface formed by epitaxial growth as its top surface, and is formed on said aluminum nitride (AlN) layer having the (1120) surface as its top surface, or via another intermediate layer.

85. (New) The thin film device as claimed in claim 84, wherein said compound thin film comprises a gallium nitride (GaN) thin film having a (1120) surface as its top surface.

86. (New) A method for fabricating a thin film device comprising the steps of:

epitaxially growing a metal sulfide selected from the group consisting of a manganese sulfide (MnS), magnesium sulfide (MgS), and calcium sulfide (CaS) on a single crystal silicon substrate by contacting a molecular metal sulfide selected from the group consisting of a manganese sulfide (MnS), magnesium sulfide (MgS), and calcium sulfide (CaS) on the single crystal silicon substrate under a reduced pressure; and

epitaxially growing an ionic compound thin film on the metal sulfide.

87. (New) The fabrication method as claimed in claim 86, wherein the step of epitaxially growing said ionic compound thin film comprises providing at least two ionic compounds.

88. (New) The fabrication method as claimed in claim 86, wherein said single crystal

silicon (100), and said compound thin film is an aluminum nitride (AlN) having a (1120) surface as its top surface.

89. (New) The fabrication method as claimed in claim 86, wherein said ionic compound thin film is one selected from the group consisting of a metal nitride thin film, a metal oxide thin film, and a metal sulfide thin film.

90. (New). A method for fabricating a thin film device comprising the step of sequentially providing a metal sulfide layer composed of one of a manganese sulfide (MnS), magnesium sulfide (MgS), and calcium sulfide (CaS) which is epitaxially grown on a single crystal silicon substrate, and an ionic compound thin film, which are epitaxially grown on said metal sulfide layer.

91. (New) The fabrication method as claimed in claim 90, wherein said compound thin film comprises a film comprising at least two ionic compounds.

92. (New) The fabrication method as claimed in claim 90, wherein said thin film of ionic compound is selected from the group consisting of a metal nitride thin film, a metal oxide thin film, and a metal sulfide thin film.

93. (New) A method for fabricating a thin film device comprising the steps of:

forming a metal sulfide layer on a single crystal silicon substrate by epitaxial growth, which metal sulfide is at least one selected from the group consisting of a manganese sulfide (MnS), magnesium sulfide (MgS), and calcium sulfide (CaS);

forming a platinum group layer on said metal sulfide layer by epitaxial growth;
and

forming an ionic compound thin film ionic bonding on said platinum group layer by epitaxial growth.

94. (New) The fabrication method as claimed in claim 93, wherein said thin film of ionic compound comprises at least one selected from the group consisting of a metal nitride thin film, a metal oxide thin film, and a metal sulfide thin film.